CERTIFIED MAIL 7018 3090 0001 9999 0191

July 29, 2019

Air and Radiation Division
U. S. Environmental Protection Agency, Region V
77 West Jackson Boulevard,
Chicago, IL 60604

Re: Submittal of U. S. Steel – Minntac and Keetac Compliance Reports per the Requirements of 40 CFR Part 52.1235(e)(5) through (7) – Taconite Regional Haze FIP

U. S. Steel – Keetac (Keetac)

Keetac utilizes Ametek Model 920 analyzers to measure NOx and SO_2 (Serial Number AE-920-10086-1).

Keetac submits quarterly excess emission reports to the Minnesota Pollution Control Agency. Therefore, to fulfill the requirements of the excess emissions and monitoring system performance reports, a copy of the quarterly excess emissions report for the 2nd quarter is included in this submittal. Where EPA's requirements per the regulation differ from Minnesota's requirements, this information is also being included.

Any periods of startup and shut down are reported in Section 5 of the DRF-1 Form included in this submittal. There were no deviations during this reporting period.

The emission limitation for SO2 (the only pollutant currently in effect) is 225 lbs/hr – 30 day rolling average. There were no deviations associated with the emission limit.

The last CEMS CGA was conducted on June 13, 2019 and is included in this submittal. The last CEMS RATA was conducted on March 19, 2019 and was previously submitted.

U. S. Steel – Minntac (Minntac)

Minntac utilizes Ametek Model 920 analyzers to measure NOx and SO_2. The table below outlines the serial numbers for each of the units:

Line 3	AE-920-10086-1
Line 4	AE-920-10086-2
Line 5	AE-920-10086-3
Line 6	ZA-920-10336-1
Line 7	ZA-920-10336-2

Minntac submits quarterly excess emission reports to the Minnesota Pollution Control Agency. Therefore, to fulfill the requirements of the excess emissions and monitoring system performance reports, a copy of the quarterly excess emissions report for the 2nd quarter is included in this submittal. Where EPA's requirements per the regulation differ from Minnesota's requirements, this information is also being included.

Any periods of startup and shut down are reported in Section 5 of the DRF-1 Form included in this submittal. There were no deviations during this reporting period.

The emission limitation for SO_2 is a 30-day rolling average aggregate limit for indurating lines 3-7 of 498 lbs/hr when all lines are producing flux pellets, 630 lbs/hr when producing acid pellets or using the equation in 40 CFR 52.1235(b)(2)(iii) when the 30 day period includes both acid and flux pellet production. There were no deviations associated with the emission limit.

The emission limitation for NOx on Line 6 and Line 7 is 1.5 lbs/MMBtu based on a 30-day rolling average. However, for any 30 or more consecutive days when only natural gas is used, a limit of 1.2 lbs/MMBtu applies. There were no deviations associated with the emission limit for Line 6 and Line 7.

The latest CEMS RATA was conducted on Lines 3-7 on May 15-16 and May 20-22, 2019. This report was submitted on July 10, 2019 The last CGAs were performed on February 21-22, 2019 and the results were reported in last quarter's report.

If you should require any additional information, please contact me at scampbell@uss.com or 218-778-8684.

Sincerely,

Stephani Campbell

Stephani Campbell
Environmental Control

U. S. Steel Corporation
Minnesota Ore Operations
P.O. Box 217
Keewatin, MN 55753

CERTIFIED MAIL 7018 3090 0001 9999 0177

July 29, 2019

Air Quality Compliance Tracking Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Re: U. S. Steel – Keetac Administrative Order by Consent
Quarterly Continuous Monitoring System Deviation Report

Dear Supervisor:

Enclosed with this letter is U. S. Steel – Keetac's (Keetac) Quarterly Continuous Emission Monitoring System Deviation report for the 2nd quarter of 2019. The Continuous Emission Monitoring System (CEMS) was certified on Keetac's Waste Gas Stack on November 6th, 2008. The CEMS was installed as a part of Keetac's Administrative Order by Consent with the State of Minnesota effective September 27th, 2007.

Deviations associated with Emission Limits

There was one deviation associated with emission limits.

Deviations associated with Monitor Downtime

There were thirty four instances of monitor downtime that affected either NO_x or SO_2. The individual downtime duration and cause is listed in the monitor downtime section of this report.

Deviations associated with Monitor Bypass

Keetac utilizes a grate/kiln system for pelletizing taconite. Although this is an extremely hot process (with temperatures exceed 2500 °F in the kiln), the equipment is designed to withstand the high temperatures and will do so during normal operation. However, the grate is very susceptible to heat damage during upset conditions or if stopped for any reason while it is hot. To prevent equipment damage and heat related safety issues during these situations, large amounts of heat must be released from the grate as soon as possible. For that reason the system was designed

such that when the grate stops or gets overheated, a stack cap is lifted to release heat through an emergency stack. At this time the monitor is bypassed. These situations are the only times the monitor is bypassed. Because they represent upset conditions or process downtime (production loss), the company has a strong vested interest in minimizing both the number and duration of occurrences.

The times listed in the monitor bypass section are when the grate emergency stack cap is open and there is combustion in the kiln. This is the only time when any NO_x and SO_2 are emitted. Times when the cap is open but there is no combustion in the kiln are not listed.

If you have any questions concerning these forms, please contact Stephani Campbell at (218) 778-8684.

Sincerely,

Lawrence Sutherland
General Manager
U. S. Steel - Minnesota Ore Operations

Enclosure

cc: Steve Palzkill – MPCA
File

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Excess Emissions Reporting Form - DRF-1

Continuous Monitoring Systems Reporting Form

Please note: This form has been updated. Please print, complete and remit only the forms. Please see the instructions in the Word version of DRF-1 to ensure proper use and understanding of definitions. DO NOT print and return the instructions.

Use this form to record and report excess emissions (EE) that are identified by *Continuous Monitoring Systems*. This includes Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS). DRF-1 is the form you must use to report excess emissions from a stack as recorded by your facility's Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS).

Address hard copy

Compliance Tracking Coordinator, Fourth Floor
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

1) General Facility Information

Company name: U. S. Steel - Keetac

AQ file no.: 62B

AQ permit no.: 13700063-005

Report covers Quarter: Second

Year: 2019

2) CEMS/COMS Data Summary Table

				Duration of Monitor Downtime			Duration of Excess Emissions (EE)		
2a)	2b)	2c)	2d)	3i)	2e)	4l)	2f)	4m)	2g)
Monitor ID Number	Monitor ID Pollutant	EU/SV ID Number	Total Operating Time (TOT) (hr)	Total Duration of Monitor Downtime (hr)	**Downtime % Of TOT**	Cumulative Duration of Exempt EE	**Exempt EE % of TOT**	Cumulative Total Duration of All EE	**Total EE % of TOT**
Line 2	NOx	SV 051	1895	25	1.3%	N/A	N/A	0	0.00%
Line 2	SO2	SV 051	1895	25	1.3%	N/A	N/A	1	0.05%

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3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

3a) Monitor ID Number	3b) Monitor ID Pollutant or Parameter	3c) Emission Unit Being Monitored	3d) Beginning Date and Time of Downtime	3e) End Date and Time of Downtime	3f) Duration of Downtime (min)	3g) Reason for Monitor Downtime (clarifying comments)	3h) Corrective ActionTaken (clarifying comments)
Line 2	SO2	SV 051	04/03/2019 06:00:00	04/03/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	05/11/2019 06:00:00	05/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	05/14/2019 16:00:00	05/14/2019 16:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	05/20/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	05/21/2019 06:00:00	05/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	05/25/2019 11:00:00	05/25/2019 12:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	05/25/2019 14:00:00	05/25/2019 16:59:00	180	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/05/2019 01:00:00	06/05/2019 01:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/05/2019 06:00:00	06/05/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	06/05/2019 08:00:00	06/05/2019 08:59:00	60	Preventative Maintenance	Performed necessary maintenance
Line 2	SO2	SV 051	06/05/2019 11:00:00	06/05/2019 11:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/12/2019 03:00:00	06/12/2019 03:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/13/2019 01:00:00	06/13/2019 02:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/14/2019 23:00:00	06/15/2019 00:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/15/2019 02:00:00	06/15/2019 05:59:00	240	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	SO2	SV 051	06/15/2019 06:00:00	06/15/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	SO2	SV 051	06/15/2019 07:00:00	06/15/2019 07:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	04/03/2019 06:00:00	04/03/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	05/11/2019 06:00:00	05/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	05/14/2019 16:00:00	05/14/2019 16:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	05/20/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	05/21/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	05/25/2019 11:00:00	05/25/2019 12:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	05/25/2019 14:00:00	05/25/2019 16:59:00	180	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/05/2019 01:00:00	06/05/2019 01:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/05/2019 06:00:00	06/05/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	06/05/2019 08:00:00	06/05/2019 08:59:00	60	Preventative Maintenance	Performed necessary maintenance
Line 2	NOx	SV 051	06/05/2019 11:00:00	06/05/2019 11:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/12/2019 03:00:00	06/12/2019 03:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/13/2019 01:00:00	06/13/2019 02:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/14/2019 23:00:00	06/15/2019 00:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/15/2019 02:00:00	06/15/2019 05:59:00	240	Primary Analyzer Malfunction	Performed necessary maintenance
Line 2	NOx	SV 051	06/15/2019 06:00:00	06/15/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 2	NOx	SV 051	06/15/2019 07:00:00	06/15/2019 07:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance

3i) Total duration of downtime: 50 hours

*Opacity time listed in minutes

4) Duration of Excess Emissions: Provide the following information regarding each individual excess emission

4a) Emission Unit ID Number	4b) Monitor ID Number	4c) Pollutant or Parameter Monitored	4d) Beginning Date and Time of EE	4e) End Date and Time of EE	4f) Limit and Averaging Period	4g) Highest Reading of EE with Units (example: 5 lb/hr, etc)	4h) Duration of Exempt EE (include these entries as part of 4i)	4i) Total Duration of All EE	4j) Cause of EE (clarifying comments)	4k) Corrective Action Taken (clarifying comments)
SV051	CM001	NOx	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV051	CM005	SO2	5/26/2019 3:00	5/26/2019 3:59	290 lb - 1Hr	338 lb/hr	0	1	EE occurred due to a large swing in SO2 emissions and the lime dosage did not keep up.	Started second lime pump and increased pH setpoint to 8.0

4l) Cumulative Duration of Exempt Excess Emissions: 0

4m) Cumulative Total Duration 1 Hrs

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (min)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass (min)	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 2	SV 051	NOx and SO2	4/3/2019 4:20	4/3/2019 5:00	40	Yes	40	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/3/2019 5:00	4/3/2019 9:01	241	Yes	241	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 12:01	4/5/2019 12:05	4	Yes	4	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 12:05	4/5/2019 12:07	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 20:17	4/5/2019 20:22	5	Yes	5	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 20:52	4/5/2019 21:00	8	Yes	8	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 21:00	4/5/2019 21:16	16	Yes	16	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 22:01	4/5/2019 22:08	7	Yes	7	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 22:10	4/5/2019 22:12	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/5/2019 22:44	4/5/2019 23:32	48	Yes	48	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/6/2019 2:37	4/6/2019 2:41	4	Yes	4	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/9/2019 23:11	4/9/2019 23:43	32	Yes	32	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/11/2019 10:55	4/11/2019 10:58	3	Yes	3	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/14/2019 4:20	4/14/2019 4:24	4	Yes	4	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/14/2019 6:22	4/14/2019 7:29	68	Yes	68	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/14/2019 10:35	4/14/2019 11:10	36	Yes	36	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/14/2019 12:21	4/14/2019 12:36	15	Yes	15	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/16/2019 22:00	4/16/2019 22:07	7	Yes	7	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/17/2019 3:11	4/17/2019 3:16	5	Yes	5	Bypass necessary to protect plant equipment	N/A

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (min)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass (min)	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 2	SV 051	NOx and SO2	4/19/2019 21:14	4/19/2019 21:17	3	Yes	3	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/19/2019 21:17	4/19/2019 21:19	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/21/2019 11:39	4/21/2019 11:47	9	Yes	9	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/23/2019 4:30	4/23/2019 5:00	30	Yes	30	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/23/2019 5:00	4/23/2019 5:54	54	Yes	54	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/23/2019 9:24	4/23/2019 10:16	52	Yes	52	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/25/2019 11:52	4/25/2019 12:02	10	Yes	10	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/25/2019 13:10	4/25/2019 16:08	178	Yes	178	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/25/2019 16:20	4/25/2019 18:40	140	Yes	140	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/25/2019 18:40	4/25/2019 18:42	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/26/2019 6:03	4/26/2019 6:25	23	Yes	23	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	4/26/2019 23:02	4/27/2019 2:59	237	Yes	237	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/9/2019 3:59	5/9/2019 5:30	91	Yes	91	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 11:35	5/10/2019 13:00	85	Yes	85	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 13:00	5/10/2019 16:06	186	Yes	186	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 16:20	5/10/2019 16:25	5	Yes	5	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 16:45	5/10/2019 20:13	208	Yes	208	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 20:15	5/10/2019 21:00	45	Yes	45	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/10/2019 21:00	5/11/2019 2:13	313	Yes	313	Bypass necessary to protect plant equipment	N/A

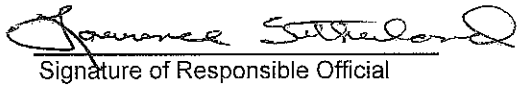
5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (min)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass (min)	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 2	SV 051	NOx and SO2	5/11/2019 2:14	5/11/2019 5:00	166	Yes	166	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 5:00	5/11/2019 10:52	352	Yes	352	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 10:52	5/11/2019 13:00	128	Yes	128	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 13:00	5/11/2019 13:07	7	Yes	7	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 14:21	5/11/2019 15:16	54	Yes	54	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 17:07	5/11/2019 17:52	45	Yes	45	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 19:23	5/11/2019 19:43	20	Yes	20	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 19:45	5/11/2019 21:00	75	Yes	75	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/11/2019 21:00	5/11/2019 21:58	58	Yes	58	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/12/2019 0:48	5/12/2019 3:10	143	Yes	143	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/12/2019 3:11	5/12/2019 3:12	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/13/2019 19:31	5/13/2019 20:53	83	Yes	83	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/13/2019 23:32	5/14/2019 5:00	328	Yes	328	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/14/2019 5:00	5/14/2019 5:39	39	Yes	39	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/15/2019 9:15	5/15/2019 11:29	134	Yes	134	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/15/2019 12:34	5/15/2019 12:46	13	Yes	13	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/16/2019 3:01	5/16/2019 3:08	7	Yes	7	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/16/2019 3:09	5/16/2019 3:13	4	Yes	4	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/18/2019 13:23	5/18/2019 13:43	20	Yes	20	Bypass necessary to protect plant equipment	N/A

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (min)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass (min)	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 2	SV 051	NOx and SO2	5/20/2019 3:51	5/20/2019 5:00	69	Yes	69	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 5:00	5/20/2019 6:25	85	Yes	85	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 6:25	5/20/2019 8:29	124	Yes	124	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 9:12	5/20/2019 9:41	29	Yes	29	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 12:55	5/20/2019 13:00	5	Yes	5	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 13:00	5/20/2019 18:08	308	Yes	308	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 19:24	5/20/2019 19:55	31	Yes	31	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 20:17	5/20/2019 21:00	43	Yes	43	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 21:00	5/20/2019 22:52	112	Yes	112	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/20/2019 22:55	5/20/2019 23:23	28	Yes	28	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/21/2019 1:42	5/21/2019 5:00	198	Yes	198	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/21/2019 5:00	5/21/2019 13:00	480	Yes	480	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/21/2019 13:00	5/21/2019 13:03	3	Yes	3	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/21/2019 17:44	5/21/2019 17:57	13	Yes	13	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	5/22/2019 11:17	5/22/2019 12:00	44	Yes	44	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/2/2019 7:07	6/2/2019 7:14	7	Yes	7	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/2/2019 7:21	6/2/2019 7:22	1	Yes	1	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/2/2019 8:17	6/2/2019 8:31	15	Yes	15	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/5/2019 2:32	6/5/2019 4:28	116	Yes	116	Bypass necessary to protect plant equipment	N/A

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (min)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass (min)	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 2	SV 051	NOx and SO2	6/5/2019 6:58	6/5/2019 9:13	135	Yes	135	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/5/2019 9:13	6/5/2019 9:15	1	Yes	1	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/5/2019 12:20	6/5/2019 12:48	28	Yes	28	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/5/2019 12:48	6/5/2019 12:51	3	Yes	3	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/14/2019 10:06	6/14/2019 12:11	125	Yes	125	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/16/2019 0:38	6/16/2019 1:59	81	Yes	81	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/16/2019 3:09	6/16/2019 3:26	17	Yes	17	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/16/2019 5:06	6/16/2019 5:23	17	Yes	17	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/19/2019 19:06	6/19/2019 21:00	114	Yes	114	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/19/2019 21:00	6/19/2019 21:18	18	Yes	18	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/20/2019 10:01	6/20/2019 10:02	2	Yes	2	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/20/2019 10:03	6/20/2019 10:06	4	Yes	4	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/20/2019 10:07	6/20/2019 12:19	133	Yes	133	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/20/2019 20:04	6/20/2019 20:14	10	Yes	10	Bypass necessary to protect plant equipment	N/A
Line 2	SV 051	NOx and SO2	6/21/2019 8:00	6/21/2019 10:12	132	Yes	132	Bypass necessary to protect plant equipment	N/A
5k) Total duration of allowable monitor bypass:							**107**	**hours**	

6) CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.



Signature of Responsible Official

Lawrence Sutherland

Printed Name of Responsible Official

General Manager- Minnesota Ore

Title

July 29, 2019

Date

COMS audits

Subject item	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
N/A								

Cylinder gas audit's (CGA)

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
SV051/EU030	1895	CM001	NOx	6/13/2019	Low 0.5% Mid 0.1%	Pass	9/30/2019	
SV051/EU030	1895	CM005	SO2	6/13/2019	Low 3.6% Mid 3.1%	Pass	9/30/2019	

Linearity

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
N/A					Low Mid High			

Relative accuracy test audit (RATA)

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Relative accuracy	Pass/fail	Next test due by:	Comments
SV051		CM001	NOx	3/19/2019	9.4%	Pass	3/31/2020	
SV051		CM005	SO2	3/19/2019	6.4%	Pass	3/31/2020	

CGA Test Report

Facility Name: US Steel KeeTac

Location: ,

SO2 WGS Audit Test Results

Mfr. & Model: AMETEK 920 SO2 NOX

Serial Number: AE-920-10086-1

Test Date: 6/13/2019

Tester: NICHOLAS WILSON

Analyzer Span: 250.000 PPMW

	Low	Mid
Reference Target	20 - 30% of Span	50 - 60% of Span
Range	(50.000 PPMW - 75.000 PPMW)	(125.000 PPMW - 150.000 PPMW)
Concentration	62.600	141.400
Cylinder No	CC168937	SG9169308BAL
Expiration Date	11/8/2020	10/22/2020

	Low		Mid	
	Time	Monitor Value	Time	Monitor Value
Run 1	09:05	61.000	09:08	137.000
Run 2	10:08	60.000	10:11	137.000
Run 3	11:08	60.000	11:11	137.000
Avg Monitor Response		60.333		137.000
Calibration Error		3.62		3.11
Absolute Diff		2.267		4.400
Test Status		PASSED		PASSED

$$\text{Calibration Error} = \frac{\text{Avg. Monitor Response - Cal. Gas Concentration}}{\text{Cal. Gas Concentration}} \times 100$$

Acceptable results for a successful CGA Audit are +/- 15% average audit value or +/- 5 PPM, whichever is greater.

CGA Test Report

Facility Name: US Steel KeeTac

Location: ,

NOX WGS Audit Test Results

Mfr. & Model: AMETEK 920 SO2 NOX

Serial Number: AE-920-10086-1

Test Date: 6/13/2019

Tester: NICHOLAS WILSON

Analyzer Span: 600.000 PPMW

	Low	Mid
Reference Target	20 - 30% of Span	50 - 60% of Span
Range	(120.000 PPMW - 180.000 PPMW)	(300.000 PPMW - 360.000 PPMW)
Concentration	130.000	324.000
Cylinder No	CC422243	CC322615
Expiration Date	2/24/2021	8/30/2024

	Low		Mid	
	Time	Monitor Value	Time	Monitor Value
Run 1	09:14	130.000	09:17	324.000
Run 2	10:17	131.000	10:20	324.000
Run 3	11:17	131.000	11:20	325.000
Avg Monitor Response		130.667		324.333
Calibration Error		0.51		0.10
Absolute Diff		0.667		0.333
Test Status		PASSED		PASSED

$$\text{Calibration Error} = \frac{\text{Avg. Monitor Response - Cal. Gas Concentration}}{\text{Cal. Gas Concentration}} \times 100$$

Acceptable results for a successful CGA Audit are +/- 15% average audit value or +/- 5 PPM, whichever is greater.

Summary Table by Monitor Downtime Type
U. S. Steel - Keetac
2nd Quarter 2019

NOx

Line	Duration (Hrs)	Description
Line 2	6	Automatic Calibration
	0	Data Handling System Malfunction
	0	Sample Interface Malfunction
	0	Excess Drift Primary Analyzer
	18	Primary Analyzer Malfunction
	1	Preventative Maintenance

SO2

Line	Duration (Hrs)	Description
Line 2	6	Automatic Calibration
	0	Data Handling System Malfunction
	0	Sample Interface Malfunction
	0	Excess Drift Primary Analyzer
	18	Primary Analyzer Malfunction
	1	Preventative Maintenance

CERTIFIED MAIL 7018 3090 0001 9999 0153

July 29, 2019

Air Quality Compliance Tracking Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Re: United States Steel Corporation, Minnesota Ore Operations – Minntac
Air Emissions Permit No. 13700005-006
Quarterly Continuous Monitoring System Deviation Report

Dear Supervisor:

Enclosed with this letter is U. S. Steel – Minntac's (Minntac) Quarterly Excess Emissions Reporting Form for the 2nd quarter of 2019. NOx/SO_2 Continuous Emission Monitoring Systems (CEMS) are certified on all Agglomerator Waste Gas Lines.

Deviations associated with Emission Limits

There were no deviations during the 2nd quarter of 2019.

Deviations associated with Monitor Downtime

There were 79 instances of monitor downtime for either NOx or SO_2. The individual downtime durations and causes are listed in the monitor downtime section of this report.

Deviations associated with Monitor Bypass

Minntac utilizes a grate/kiln system for pelletizing taconite. Although this is an extremely hot process (with temperatures exceed 2500°F in the kiln), the equipment is designed to withstand the high temperatures and will do so during normal operation. However, the grate is very susceptible to heat damage during upset conditions or if stopped for any reason while it is hot. To prevent equipment damage and heat related safety issues during these situations, large amounts of heat must be released from the grate as soon as possible. For that reason the system was designed such that when the grate stops or gets overheated, a stack cap is lifted to release heat through an emergency stack. At this time the monitor is bypassed. These situations are the only times the monitor is bypassed. Because they represent upset conditions or process downtime (production loss), the company has a strong vested interest in minimizing both the number and duration of occurrences.

The times listed in the monitor bypass section are when the grate emergency stack cap is open and there is combustion in the kiln. This is the only time when any NO_x or SO_2 is emitted. Times when the cap is open but there is no combustion in the kiln are not listed.

If you have any questions concerning these forms, please contact Stephani Campbell at (218) 778-8684.

Sincerely,

Lawrence Sutherland
General Manager – Minnesota Ore Operations

Enclosure

cc: Steve Palzkill – MPCA
File

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

DRF-1

Excess Emissions Reporting Form

Air Quality Permit Program

Doc Type: Excess Emission Report

Note: Please complete, and remit **only** the forms. Please see the instructions to ensure proper use and understanding of definitions.
Do not print and return the instructions.

General Information about Deviation and Compliance Reporting

If your permit requires you to submit deviation reports or an annual compliance certification, you should use the Deviation Reporting Forms (DRFs) and Annual Compliance Certification Report (CR-04), unless you get Minnesota Pollution Control Agency (MPCA) approval to use another format or your facility's permit specifies otherwise. There are two separate DRF forms: DRF-1 and DRF-2.

DRF-1 is used to report direct excess stack emissions (EE) recorded by Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems

DRF-2 is used to report deviations recorded by periodic monitoring systems, deviations of permitted operating conditions and surrogate parameters whether recorded
Some examples: flow rate, temperature, throughput, control equipment operating parameters, fuel-use records

CR-04: is used to report facility compliance status at the end of each year if required by your permit.

Address hard copy report submittals to: Air Compliance Tracking Coordinator, Minnesota Pollution Control Agency
520 Lafayette Road North, St. Paul, Minnesota 55155-4195

Or e-mail a signed and scanned PDF copy to: AQRoutineReport.PCA@state.mn.us
(see e-mail instructions in "Routine Air Report Instructions Letter" at:
http://www.pca.state.mn.us/nwqh472

1) General Facility Information

Facility name: United States Steel Corporation, Minnesota Ore Operations, Minntac
County: St. Louis
Report covers quarter: Second
AQ file no.: 26A
AQ permit #: 13700005
Year: 2019

2) CEMS/COMS Data Summary Table

				Duration of Monitor Downtime		Duration of Excess Emissions (EE)			
2a) Monitor ID Number	2b) Monitor ID Pollutant	2c) EU/SV ID Number	2d) Total Operating Time (TOT)	3i) Total Duration of Monitor Downtime (hr)	2e) **Downtime % Of TOT**	4l) Cumulative Duration of Exempt EE	2f) **Exempt EE % of TOT**	4m) Cumulative Total Duration of All EE	2g) **Total EE % of TOT**
MR 001	NOx	SV-103	1828	1	**0.1%**	0	**0%**	0	**0%**
MR 002	NOx	SV-118	2106	2	**0.1%**	0	**0%**	0	**0%**
MR 003	NOx	SV-127	2142	25	**1.2%**	0	**0%**	0	**0%**
MR 004	NOx	SV-144	2094	45	**2.1%**	0	**0%**	0	**0%**
MR 005	NOx	SV-151	2090	17	**0.8%**	0	**0%**	0	**0%**
MR 001	SO2	SV-103	1828	1	**0.1%**	0	**0%**	0	**0%**
MR 002	SO2	SV-118	2106	3	**0.1%**	0	**0%**	0	**0%**
MR 003	SO2	SV-127	2142	28	**1.3%**	0	**0%**	0	**0%**
MR 004	SO2	SV-144	2094	46	**2.2%**	0	**0%**	0	**0%**
MR 005	SO2	SV-151	2090	16	**0.8%**	0	**0%**	0	**0%**

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

3a) Monitor ID Number	3b) Pollutant or parameter monitored	3c) Emission Unit Being Monitored	3d) Beginning Date and Time of Downtime	3e) End Date and Time of Downtime	3f) Duration of Downtime (minutes)	3g) Reason for Monitor Downtime (clarifying comments)	3h) Corrective ActionTaken (clarifying comments)
Line 3	NOx	SV103	05/11/2019 05:00:00	05/11/2019 05:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 3	SO2	SV103	05/11/2019 05:00:00	05/11/2019 05:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	NOx	SV118	04/13/2019 06:00:00	04/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	NOx	SV118	05/22/2019 06:00:00	05/22/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	04/13/2019 06:00:00	04/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	05/14/2019 06:00:00	05/14/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	05/22/2019 06:00:00	05/22/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	04/10/2019 06:00:00	04/10/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	05/17/2019 13:00:00	05/17/2019 14:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/19/2019 17:00:00	06/20/2019 05:59:00	780	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/20/2019 06:00:00	06/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	06/20/2019 07:00:00	06/20/2019 07:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 02:00:00	06/21/2019 05:59:00	240	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 06:00:00	06/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 07:00:00	06/21/2019 07:59:00	60	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/24/2019 06:00:00	06/24/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	04/10/2019 06:00:00	04/10/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	05/17/2019 13:00:00	05/17/2019 14:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	SO2	SV127	05/18/2019 06:00:00	05/18/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	05/18/2019 07:00:00	05/18/2019 07:59:00	60	Excess Drift Primary Analyzer	Performed necessary maintenance
Line 5	SO2	SV127	05/18/2019 08:00:00	05/18/2019 08:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	06/19/2019 17:00:00	06/20/2019 05:59:00	780	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	SO2	SV127	06/20/2019 06:00:00	06/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	06/20/2019 07:00:00	06/20/2019 07:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	SO2	SV127	06/21/2019 02:00:00	06/21/2019 05:59:00	240	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	SO2	SV127	06/21/2019 06:00:00	06/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	06/21/2019 07:00:00	06/21/2019 07:59:00	60	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	SO2	SV127	06/24/2019 06:00:00	06/24/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	04/04/2019 06:00:00	04/04/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	04/10/2019 11:00:00	04/10/2019 16:59:00	360	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	04/10/2019 17:00:00	04/10/2019 17:59:00	60	Automatic Calibration	Performed necessary maintenance

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

3a) Monitor ID Number	3b) Pollutant or parameter monitored	3c) Emission Unit Being Monitored	3d) Beginning Date and Time of Downtime	3e) End Date and Time of Downtime	3f) Duration of Downtime (minutes)	3g) Reason for Monitor Downtime (clarifying comments)	3h) Corrective ActionTaken (clarifying comments)
Line 6	NOx	SV144	04/10/2019 18:00:00	04/11/2019 05:59:00	720	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	04/11/2019 06:00:00	04/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	04/11/2019 07:00:00	04/11/2019 12:59:00	360	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	04/11/2019 13:00:00	04/11/2019 13:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	05/08/2019 19:00:00	05/08/2019 21:59:00	180	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	06/13/2019 06:00:00	06/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	06/14/2019 06:00:00	06/14/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	06/24/2019 07:00:00	06/24/2019 08:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	NOx	SV144	06/25/2019 06:00:00	06/25/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	06/27/2019 06:00:00	06/27/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	NOx	SV144	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	04/04/2019 06:00:00	04/04/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	04/10/2019 11:00:00	04/10/2019 16:59:00	360	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	04/10/2019 17:00:00	04/10/2019 17:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	04/10/2019 18:00:00	04/11/2019 05:59:00	720	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	04/11/2019 06:00:00	04/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	04/11/2019 07:00:00	04/11/2019 12:59:00	360	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	04/11/2019 13:00:00	04/11/2019 13:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	05/21/2019 06:00:00	05/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	05/21/2019 07:00:00	05/21/2019 07:59:00	60	Excess Drift Primary Analyzer	Performed necessary maintenance
Line 6	SO2	SV144	05/21/2019 08:00:00	05/21/2019 08:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	05/29/2019 09:00:00	05/29/2019 09:59:00	60	Sample Interface Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	06/13/2019 06:00:00	06/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	06/14/2019 06:00:00	06/14/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	06/24/2019 07:00:00	06/24/2019 08:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 6	SO2	SV144	06/25/2019 06:00:00	06/25/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	06/27/2019 06:00:00	06/27/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 6	SO2	SV144	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 7	NOx	SV151	04/26/2019 06:00:00	04/26/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	05/03/2019 04:00:00	05/03/2019 04:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	05/03/2019 05:00:00	05/03/2019 05:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 7	NOx	SV151	05/03/2019 07:00:00	05/03/2019 07:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Secondary Analyzer Malfunction	Performed necessary maintenance

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

3a) Monitor ID Number	3b) Pollutant or parameter monitored	3c) Emission Unit Being Monitored	3d) Beginning Date and Time of Downtime	3e) End Date and Time of Downtime	3f) Duration of Downtime (minutes)	3g) Reason for Monitor Downtime (clarifying comments)	3h) Corrective ActionTaken (clarifying comments)
Line 7	NOx	SV151	05/30/2019 07:00:00	05/30/2019 07:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	06/14/2019 06:00:00	06/14/2019 07:59:00	120	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	06/18/2019 06:00:00	06/18/2019 07:59:00	120	Automatic Calibration	Performed necessary maintenance
Line 7	NOx	SV151	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 7	SO2	SV151	04/26/2019 06:00:00	04/26/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	05/03/2019 04:00:00	05/03/2019 04:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	05/03/2019 05:00:00	05/03/2019 05:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 7	SO2	SV151	05/03/2019 07:00:00	05/03/2019 07:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 7	SO2	SV151	05/30/2019 07:00:00	05/30/2019 07:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	06/14/2019 06:00:00	06/14/2019 07:59:00	120	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	06/18/2019 07:00:00	06/18/2019 07:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 7	SO2	SV151	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer Malfunction	Performed necessary maintenance
				3i) Total duration of downtime:	**184**	**hours**	

4) Duration of Excess Emissions: Provide the following information regarding each individual excess emission identified by a monitor. Make a separate table for each monitor, as needed.

4a) Emission Unit ID Number	4b) Monitor ID Number	4c) Pollutant or Parameter Monitored	4d) Beginning Date and Time of EE	4e) End Date and Time of EE	4f) Limit and Averaging Period	4g) Highest Reading of EE with Units (example: 5 lb/hr, etc)	4h) Duration of Exempt EE (include these entries as part of 4i)	4i) Total Duration of All EE	4j) Cause of EE (clarifying comments)	4k) Corrective Action Taken (clarifying comments)
SV-103	MR 001	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV-118	MR 002	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV-127	MR 003	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV-144	MR 004	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV-151	MR 005	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	N/A
						4l) Cumulative Duration of Exempt Excess Emissions:		0	**4m) Cumulative Total**	0

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 3	SV103	NOx/SO2	4/15/19 12:59	4/15/19 14:30	91	YES	91	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 14:30	4/15/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 19:00	4/15/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 22:30	4/16/19 0:59	149	YES	149	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 8:59	4/16/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 14:30	4/16/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 19:00	4/16/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 22:30	4/17/19 5:57	447	YES	447	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 6:47	4/17/19 7:00	13	YES	13	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 7:00	4/17/19 10:25	205	YES	205	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 11:31	4/17/19 12:50	79	YES	79	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 14:48	4/17/19 16:58	130	YES	130	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/20/19 8:21	4/20/19 10:35	134	YES	134	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/26/19 7:55	4/26/19 9:25	91	YES	91	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/26/19 17:36	4/26/19 18:01	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/29/19 15:48	4/29/19 15:59	11	YES	11	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/29/19 16:03	4/29/19 16:13	10	YES	10	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/29/19 16:41	4/29/19 16:47	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/2/19 9:10	5/2/19 12:48	218	YES	218	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 3	SV103	NOx/SO2	5/2/19 19:58	5/2/19 21:48	110	YES	110	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/7/19 3:36	5/7/19 3:37	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/11/19 2:13	5/11/19 6:30	257	YES	257	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/11/19 6:30	5/11/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/26/19 8:54	5/26/19 9:02	7	YES	7	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/4/19 10:25	6/4/19 11:50	84	YES	84	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/4/19 13:17	6/4/19 14:07	50	YES	50	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/9/19 2:19	6/9/19 2:58	39	YES	39	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/18/19 13:38	6/18/19 14:30	52	YES	52	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/18/19 14:30	6/18/19 18:27	237	YES	237	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/27/19 3:15	6/27/19 3:33	18	YES	18	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/6/19 7:41	4/6/19 9:44	123	YES	123	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/6/19 10:35	4/6/19 10:47	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/10/19 8:21	4/10/19 8:35	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/11/19 12:54	4/11/19 13:59	65	YES	65	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/12/19 9:59	4/12/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/12/19 14:30	4/12/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/12/19 19:00	4/12/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/12/19 22:30	4/13/19 6:30	480	YES	480	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 4	SV118	NOx/SO2	4/13/19 6:30	4/13/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/13/19 7:00	4/13/19 9:30	151	YES	151	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/22/19 8:21	4/22/19 11:47	206	YES	206	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/30/19 22:28	4/30/19 22:30	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/30/19 22:30	4/30/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 9:59	5/1/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 14:30	5/1/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 19:00	5/1/19 22:30	211	YES	211	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 22:30	5/1/19 23:43	73	YES	73	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 0:25	5/2/19 1:05	39	YES	39	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 1:19	5/2/19 2:00	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 2:25	5/2/19 3:05	40	YES	40	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 3:51	5/2/19 4:24	33	YES	33	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/3/19 12:49	5/3/19 13:42	53	YES	53	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/4/19 9:29	5/4/19 11:23	114	YES	114	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/4/19 11:37	5/4/19 12:47	70	YES	70	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/4/19 12:50	5/4/19 13:42	53	YES	53	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/6/19 13:51	5/6/19 14:06	15	YES	15	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/6/19 16:37	5/6/19 17:04	26	YES	26	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 4	SV118	NOx/SO2	5/6/19 21:24	5/6/19 21:25	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/6/19 21:47	5/6/19 21:51	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 1:50	5/7/19 1:54	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 4:55	5/7/19 5:59	64	YES	64	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 8:59	5/7/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 14:30	5/7/19 14:58	28	YES	28	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 16:34	5/7/19 16:52	18	YES	18	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/18/19 10:10	5/18/19 12:48	159	YES	159	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 6:10	5/22/19 6:30	20	YES	20	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 6:30	5/22/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 7:00	5/22/19 10:47	227	YES	227	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 10:47	5/22/19 14:30	223	YES	223	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 14:30	5/22/19 14:32	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/24/19 22:34	5/24/19 23:51	77	YES	77	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/30/19 9:57	5/30/19 10:32	35	YES	35	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/3/19 15:05	6/3/19 15:22	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/4/19 10:25	6/4/19 11:06	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/4/19 14:57	6/4/19 15:59	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/6/19 11:59	6/6/19 14:30	151	YES	151	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 4	SV118	NOx/SO2	6/6/19 14:30	6/6/19 19:00	269	YES	269	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/6/19 19:00	6/7/19 6:07	668	YES	668	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/14/19 16:27	6/14/19 19:00	152	YES	152	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/14/19 19:00	6/14/19 21:04	125	YES	125	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/21/19 4:42	6/21/19 6:10	88	YES	88	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/24/19 15:19	6/24/19 15:38	19	YES	19	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/3/19 10:08	4/3/19 11:49	102	YES	102	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/5/19 8:00	4/5/19 9:02	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 9:06	4/7/19 9:30	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 22:28	4/7/19 22:30	1	YES	1	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 22:30	4/7/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 6:59	4/9/19 14:30	451	YES	451	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 14:30	4/9/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 19:00	4/9/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 22:30	4/10/19 0:54	144	YES	144	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 1:16	4/10/19 3:09	113	YES	113	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 3:31	4/10/19 5:25	113	YES	113	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 5:49	4/10/19 6:30	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 6:30	4/10/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 7:00	4/10/19 7:52	53	YES	53	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 5	SV127	NOx/SO2	4/26/19 10:14	4/26/19 11:40	86	YES	86	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/29/19 7:59	4/29/19 9:10	71	YES	71	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/14/19 22:28	5/14/19 22:30	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/14/19 22:30	5/14/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 8:59	5/15/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 14:30	5/15/19 19:00	269	YES	269	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 19:00	5/15/19 20:44	105	YES	105	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/16/19 14:09	5/16/19 14:13	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/17/19 5:11	5/17/19 6:21	70	YES	70	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/17/19 8:10	5/17/19 8:17	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/18/19 16:15	5/18/19 16:18	3	YES	3	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 8:02	5/31/19 9:11	69	YES	69	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 10:26	5/31/19 11:02	36	YES	36	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 11:37	5/31/19 12:03	27	YES	27	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 13:12	5/31/19 14:03	52	YES	52	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/1/19 23:14	6/1/19 23:32	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/3/19 10:00	6/3/19 13:06	186	YES	186	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 9:04	6/4/19 14:30	326	YES	326	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 14:30	6/4/19 16:36	126	YES	126	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 16:42	6/4/19 16:44	2	YES	2	Bypass necessary to protect plant equipment.	N/A

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5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 5	SV127	NOx/SO2	6/4/19 19:20	6/4/19 21:12	112	YES	112	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/7/19 8:03	6/7/19 9:28	85	YES	85	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/12/19 8:52	6/12/19 9:38	46	YES	46	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 1:04	6/14/19 1:28	24	YES	24	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 1:45	6/14/19 2:06	21	YES	21	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 2:27	6/14/19 3:05	38	YES	38	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 19:05	6/14/19 21:27	141	YES	141	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 13:39	6/23/19 14:30	51	YES	51	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 14:30	6/23/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 19:00	6/23/19 19:52	52	YES	52	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 20:45	6/23/19 21:17	32	YES	32	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 5:47	6/24/19 6:30	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 6:30	6/24/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 7:00	6/24/19 10:14	195	YES	195	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/27/19 8:07	6/27/19 8:49	42	YES	42	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 2:21	4/4/19 4:26	126	YES	126	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 6:34	4/4/19 7:00	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 7:00	4/4/19 9:29	150	YES	150	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 11:29	4/4/19 13:59	150	YES	150	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/25/19 19:29	4/25/19 19:33	4	YES	4	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 6	SV144	NOx/SO2	4/25/19 19:37	4/25/19 20:06	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 5:19	4/26/19 6:30	71	YES	71	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 6:30	4/26/19 6:34	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 7:27	4/26/19 8:48	81	YES	81	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/29/19 17:08	4/29/19 17:50	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/3/19 14:30	5/3/19 14:34	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/7/19 22:30	5/7/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 10:59	5/8/19 14:30	221	YES	221	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 14:30	5/8/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 19:00	5/8/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 22:30	5/8/19 23:32	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 0:18	5/9/19 2:16	117	YES	117	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 2:19	5/9/19 4:43	144	YES	144	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 4:47	5/9/19 6:01	74	YES	74	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/10/19 7:27	5/10/19 7:44	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/13/19 7:41	5/13/19 7:55	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/22/19 20:06	5/22/19 20:11	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/27/19 17:57	5/27/19 18:02	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/28/19 0:42	5/28/19 0:48	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/29/19 9:55	5/29/19 10:44	49	YES	49	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 6	SV144	NOx/SO2	6/3/19 22:33	6/3/19 23:51	79	YES	79	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/4/19 5:07	6/4/19 6:13	66	YES	66	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/9/19 21:47	6/9/19 21:59	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 3:59	6/13/19 6:30	151	YES	151	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 6:30	6/13/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 7:00	6/13/19 14:30	450	YES	450	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 14:30	6/13/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 19:00	6/13/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 22:30	6/14/19 6:30	480	YES	480	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 6:30	6/14/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 7:00	6/14/19 14:21	441	YES	441	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 14:39	6/14/19 14:49	9	YES	9	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 15:34	6/14/19 15:48	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 16:19	6/14/19 16:20	1	YES	1	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 16:24	6/14/19 16:36	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 20:09	6/14/19 22:30	141	YES	141	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 22:30	6/15/19 1:42	192	YES	192	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/25/19 6:49	6/25/19 7:00	11	YES	11	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/25/19 7:00	6/25/19 9:24	144	YES	144	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/26/19 22:41	6/26/19 23:51	70	YES	70	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 6	SV144	NOx/SO2	6/27/19 2:00	6/27/19 3:14	74	YES	74	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 5:47	6/27/19 6:30	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 6:30	6/27/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 7:00	6/27/19 8:50	111	YES	111	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/1/19 19:12	4/1/19 19:16	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/4/19 20:55	4/4/19 21:01	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/6/19 8:59	4/6/19 9:25	26	YES	26	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/9/19 16:45	4/9/19 16:52	7	YES	7	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/9/19 19:45	4/9/19 20:02	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/11/19 21:54	4/11/19 22:16	21	YES	21	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/15/19 21:49	4/15/19 21:53	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/19/19 16:13	4/19/19 16:22	9	YES	9	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/23/19 22:30	4/23/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/24/19 9:59	4/24/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/24/19 14:30	4/24/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/24/19 19:00	4/24/19 21:59	179	YES	179	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 5:22	4/26/19 6:30	68	YES	68	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 6:30	4/26/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 7:00	4/26/19 7:47	48	YES	48	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/1/19 11:40	5/1/19 12:22	41	YES	41	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a) Monitor ID number	5b) Emission Unit Required to be Monitored	5c) Pollutant and Limit Required to be Monitored	5d) Beginning Date and Time of Bypass Period	5e) End date and time of bypass period	5f) Duration of monitor bypass (minutes)	5g) Was P.C.E. operating during bypass period?	5h) Duration of allowable monitor bypass	5i) Reason for monitor bypass (clarifying comments)	5j) Corrective action taken (clarifying comments)
Line 7	SV151	NOx/SO2	5/2/19 9:30	5/2/19 9:34	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/3/19 6:14	5/3/19 6:30	16	YES	16	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/3/19 6:30	5/3/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/3/19 7:00	5/3/19 9:33	153	YES	153	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/9/19 10:42	5/9/19 10:57	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/14/19 5:13	5/14/19 5:48	35	YES	35	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/26/19 14:05	5/26/19 14:30	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/26/19 14:30	5/26/19 14:45	15	YES	15	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/26/19 17:49	5/26/19 17:59	10	YES	10	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/29/19 16:30	5/29/19 16:55	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/30/19 7:36	5/30/19 8:08	32	YES	32	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/4/19 0:06	6/4/19 0:57	50	YES	50	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/5/19 9:06	6/5/19 9:44	38	YES	38	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/8/19 19:21	6/8/19 21:26	125	YES	125	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/13/19 9:59	6/13/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/13/19 14:30	6/13/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/13/19 19:00	6/13/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/13/19 22:30	6/14/19 6:30	480	YES	480	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/14/19 6:30	6/14/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	6/14/19 7:00	6/14/19 8:12	72	YES	72	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system *See Minn. R. 7017.1110 subp. 2c*

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
5k) Total duration of allowable monitor bypass:							**372**	**hours**	

6) CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature of Responsible Official

Lawrence Sutherland
Printed Name of Responsible Official

General Manager - Minnesota Ore Operations
Title

July 29, 2019
Date

COMS audits

Subject item	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
N/A								

Cylinder gas audit's (CGA)

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
SV103		MR001	NOx	2/21/2019	Low 0.2% Mid 1.4%	Pass	9/30/2019	RATA 2nd Qtr
SV118		MR002	NOx	2/21/2019	Low 1.2% Mid 0.5%	Pass	9/30/2019	RATA 2nd Qtr
SV127		MR003	NOx	2/21/2019	Low 2.6% Mid 1.6%	Pass	9/30/2019	RATA 2nd Qtr
SV144		MR004	NOx	2/22/2019	Low 0.7% Mid 0.2%	Pass	9/30/2019	RATA 2nd Qtr
SV151		MR005	NOx	2/22/2019	Low 1.8% Mid 2.1%	Pass	9/30/2019	RATA 2nd Qtr
SV103		MR001	SO2	2/21/2019	Low 6.8% Mid 2.7%	Pass	9/30/2019	RATA 2nd Qtr
SV118		MR002	SO2	2/21/2019	Low 0.0% Mid 0.0%	Pass	9/30/2019	RATA 2nd Qtr
SV127		MR003	SO2	2/21/2019	Low 3.4% Mid 1.6%	Pass	9/30/2019	RATA 2nd Qtr
SV144		MR004	SO2	2/22/2019	Low 1.2% Mid 0.9%	Pass	9/30/2019	RATA 2nd Qtr
SV151		MR005	SO2	2/22/2019	Low 0.5% Mid 2.3%	Pass	9/30/2019	RATA 2nd Qtr

Linearity

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
N/A					Low Mid High			

Relative accuracy test audit (RATA)

Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Relative accuracy	Pass/fail	Next test due by:	Comments
SV103	1828	MR001	SO2	5/15/2019	4.6%	Pass	2nd Qtr 2020	
SV103	1828	MR001	NOx	5/15/2019	6.3%	Pass	2nd Qtr 2020	
SV118	2106	MR002	SO2	5/16/2019	16.2%	Pass	2nd Qtr 2020	
SV118	2106	MR002	NOx	5/16/2019	6.3%	Pass	2nd Qtr 2020	
SV127	2142	MR003	SO2	5/20/2019	4.9%	Pass	2nd Qtr 2020	
SV127	2142	MR003	NOx	5/20/2019	16.7%	Pass	2nd Qtr 2020	
SV144	2094	MR004	SO2	5/22/2019	4.0%	Pass	2nd Qtr 2020	
SV144	2094	MR004	NOx	5/22/2019	13.1%	Pass	2nd Qtr 2020	
SV151	2090	MR005	SO2	5/21/2019	17.3%	Pass	2nd Qtr 2020	
SV151	2090	MR005	NOx	5/21/2019	2.9%	Pass	2nd Qtr 2020	

U.S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 19, 2019

TABLE 1

RATA RESULTS SUMMARY
Line 3 Waste Gas Stack (SV103)
May 15, 2019

Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
SO_2, lb/hr	Run 1 0817-0838	Run 2 0904-0925	Run 3 0941-1002	Run 4 1002-1023	Run 5 1042-1103	Run 6 1103-1124	Run 7 1139-1200	Run 8 1200-1221	Run 10 1302-1323
Ref. Method lb/hr	65.5	65.6	68.0	79.2	79.9	68.5	77.1	84.0	69.4
CEM lb/hr	61.8	63.0	66.6	74.9	76.5	66.8	75.6	82.8	66.5
Difference	-3.7	-2.6	-1.4	-4.3	-3.4	-1.7	-1.5	-1.2	-2.9
Average Difference	-2.5	Standard Deviation of the Differences			1.1	Relative Accuracy			4.6%
Confidence Coefficient	0.9	Average Reference Method, lb/hr			73.0	Average CEM, lb/hr			70.5

Oxides of Nitrogen Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
NO_X, lb/hr	Run 1 0817-0838	Run 2 0904-0925	Run 3 0941-1002	Run 4 1002-1023	Run 5 1042-1103	Run 6 1103-1124	Run 7 1139-1200	Run 9 1241-1302	Run 10 1302-1323
Ref. Method lb/hr	170.4	171.2	156.9	182.2	166.9	158.2	181.6	184.2	184.0
CEM lb/hr	177.3	178.1	168.0	188.6	175.6	167.1	192.5	196.4	195.3
Difference	6.9	6.8	11.1	6.4	8.7	8.8	10.9	12.2	11.3
Average Difference	9.2	Standard Deviation of the Differences			2.2	Relative Accuracy			6.3%
Confidence Coefficient	1.7	Average Reference Method, lb/hr			172.9	Average CEM, lb/hr			182.1

U.S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 19, 2019

TABLE 2

RATA RESULTS SUMMARY
Line 4 Waste Gas Stack (SV118)
May 16, 2018

Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
SO_2, lb/hr	Run 1 1235-1256	Run 2 1256-1317	Run 3 1329-1350	Run 4 1350-1411	Run 5 1427-1448	Run 6 1448-1509	Run 7 1526-1547	Run 9 1622-1643	Run 10 1703-1724
Ref. Method lb/hr	41.7	38.2	41.3	43.1	41.9	43.4	43.0	38.0	43.9
CEM lb/hr	38.6	35.0	38.5	39.5	39.9	38.7	34.1	32.3	35.0
Difference	-3.1	-3.2	-2.8	-3.6	-2.0	-4.7	-8.9	-5.7	-8.9
Average Difference	-4.8	Standard Deviation of the Differences			2.6	Relative Accuracy			16.2%
Confidence Coefficient	2.0	Average Reference Method, lb/hr			41.6	Average CEM, lb/hr			36.8

Oxides of Nitrogen Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
NO_X, lb/hr	Run 1 1235-1256	Run 2 1256-1317	Run 3 1329-1350	Run 4 1350-1411	Run 5 1427-1448	Run 6 1448-1509	Run 7 1526-1547	Run 8 1547-1608	Run 9 1622-1643
Ref. Method lb/hr	226.2	231.8	227.3	234.6	241.5	241.7	238.6	225.5	205.4
CEM lb/hr	227.8	241.4	235.7	248.9	252.3	255.0	247.1	239.3	223.5
Difference	1.6	9.6	8.4	14.3	10.8	13.3	8.5	13.8	18.1
Average Difference	10.9	Standard Deviation of the Differences			4.7	Relative Accuracy			6.3%
Confidence Coefficient	3.6	Average Reference Method, lb/hr			230.3	Average CEM, lb/hr			241.2

U.S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 19, 2019

TABLE 3

RATA RESULTS SUMMARY
Line 5 Waste Gas Stack (SV127)
May 20, 2019

Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
SO_2, lb/hr	Run 1 0937-0958	Run 3 1052-1113	Run 4 1113-1134	Run 5 1146-1207	Run 6 1207-1228	Run 7 1245-1306	Run 8 1306-1327	Run 9 1340-1401	Run 10 1401-1422
Ref. Method lb/hr	42.8	38.1	43.5	45.9	40.3	42.8	36.9	41.1	41.5
CEM lb/hr	40.6	36.2	40.4	44.9	40.7	41.4	36.2	40.2	41.2
Difference	-2.2	-1.9	-3.1	-1.0	0.4	-1.4	-0.7	-0.9	-0.3
Average Difference	-1.2	Standard Deviation of the Differences			1.1	**Relative Accuracy**			4.9%
Confidence Coefficient	0.8	Average Reference Method, lb/hr			41.4	Average CEM, lb/hr			40.1

Oxides of Nitrogen Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
NO_X, lb/hr	Run 1 0937-0958	Run 2 1010-1031	Run 3 1052-1113	Run 4 1113-1134	Run 5 1146-1207	Run 6 1207-1228	Run 7 1245-1306	Run 8 1306-1327	Run 10 1401-1422
Ref. Method lb/hr	386.7	402.0	346.7	371.4	383.8	385.8	382.4	387.5	372.8
CEM lb/hr	431.8	442.8	392.2	424.6	443.9	452.4	443.1	449.7	439.9
Difference	45.2	40.8	45.5	53.2	60.1	66.6	60.7	62.2	67.0
Average Difference	55.7	Standard Deviation of the Differences			9.9	**Relative Accuracy**			16.7%
Confidence Coefficient	7.6	Average Reference Method, lb/hr			379.9	Average CEM, lb/hr			435.1

U.S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 19, 2019

TABLE 4

RATA RESULTS SUMMARY
Line 6 Waste Gas Stack (SV144)
May 22, 2019

Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
SO_2, lb/hr	Run 1 0950-1011	Run 2 1139-1200	Run 3 1235-1256	Run 4 1256-1317	Run 6 1353-1414	Run 7 1429-1450	Run 8 1450-1511	Run 9 1524-1545	Run 10 1545-1606
Ref. Method lb/hr	32.4	21.6	53.7	70.2	37.3	47.1	46.3	42.9	42.4
CEM lb/hr	30.0	22.0	52.5	68.6	36.3	45.3	45.1	42.4	42.5
Difference	-2.4	0.4	-1.2	-1.6	-1.0	-1.8	-1.2	-0.5	0.1
Average Difference	-1.0	Standard Deviation of the Differences			0.9	Relative Accuracy			4.0%
Confidence Coefficient	0.7	Average Reference Method, lb/hr			43.8	Average CEM, lb/hr			42.8

Oxides of Nitrogen Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
NO_X, lb/hr	Run 1 0950-1011	Run 2 1139-1200	Run 3 1235-1256	Run 4 1256-1317	Run 5 1332-1353	Run 6 1353-1414	Run 7 1429-1450	Run 9 1524-1545	Run 10 1545-1606
Ref. Method lb/hr	233.5	193.5	292.6	324.5	266.1	264.5	276.1	266.2	266.4
CEM lb/hr	258.6	214.1	326.1	362.0	294.4	297.8	309.7	297.2	299.6
Difference	25.1	20.6	33.5	37.5	28.2	33.3	33.6	31.0	33.2
Average Difference	30.7	Standard Deviation of the Differences			5.2	Relative Accuracy			13.1%
Confidence Coefficient	4.0	Average Reference Method, lb/hr			264.8	Average CEM, lb/hr			295.0

U.S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 20, 2019

TABLE 5

RATA RESULTS SUMMARY
Line 7 Waste Gas Stack (SV151)
May 21, 2019

Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
SO_2, lb/hr	Run 1 1025-1046	Run 2 1046-1107	Run 3 1119-1140	Run 4 1140-1201	Run 5 1213-1234	Run 6 1234-1255	Run 7 1309-1330	Run 8 1330-1351	Run 9 1412-1433
Ref. Method lb/hr	41.4	40.2	36.0	34.4	40.9	27.9	27.2	30.6	30.9
CEM lb/hr	41.8	42.9	38.5	38.1	45.5	33.6	32.7	36.5	38.4
Difference	0.4	2.7	2.5	3.7	4.6	5.7	5.5	5.9	7.5
Average Difference	4.3	Standard Deviation of the Differences			2.2	**Relative Accuracy**			**17.3%**
Confidence Coefficient	1.7	Average Reference Method, lb/hr			34.4	Average CEM, lb/hr			38.7

Oxides of Nitrogen Emission Rate Relative Accuracy - Calculated Using the Reference Method Average						*Relative Accuracy Limit*			*20%*
NO_x, lb/hr	Run 1 1025-1046	Run 2 1046-1107	Run 3 1119-1140	Run 4 1140-1201	Run 5 1213-1234	Run 6 1234-1255	Run 7 1309-1330	Run 8 1330-1351	Run 10 1448-1509
Ref. Method lb/hr	213.4	211.6	213.2	213.9	212.0	181.4	192.7	190.9	193.5
CEM lb/hr	207.7	209.1	213.8	213.9	215.9	178.5	183.5	185.7	188.4
Difference	-5.7	-2.5	0.6	0.0	3.9	-2.9	-9.2	-5.2	-5.1
Average Difference	-2.9	Standard Deviation of the Differences			4.0	**Relative Accuracy**			**2.9%**
Confidence Coefficient	3.0	Average Reference Method, lb/hr			202.5	Average CEM, lb/hr			201.0

Summary Table by Monitor Downtime Type
U. S. Steel - Minntac
2nd Quarter 2019

NOx

Line	Duration (Hrs)	Description
Line 3	1	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
	0	Sample Interface Malfunction
Line 4	2	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
Line 5	4	Automatic Calibration
	0	Data Handling System Malfunction
	5	Secondary Analyzer Malfunction
	0	Excess Drift Primary Analyzer
	16	Primary Analyzer Malfunction
Line 6	8	Automatic Calibration
	0	Data Handling System Malfunction
	8	Secondary Analyzer Malfunction
	0	Excess Drift Primary Analyzer
	29	Primary Analyzer Malfunction
Line 7	8	Automatic Calibration
	0	Data Handling System Malfunction
	8	Secondary Analyzer Malfunction
	0	Excess Drift Primary Analyzer
	1	Primary Analyzer Malfunction
	0	Preventative Maintenance

SO2

Line	Duration (Hrs)	Description
Line 3	1	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
Line 4	3	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
	0	Preventative Maintenance
Line 5	6	Automatic Calibration
	0	Data Handling System Malfunction
	5	Secondary Analyzer Malfunction
	1	Excess Drift Primary Analyzer
	16	Primary Analyzer Malfunction
	0	Preventative Maintenance
Line 6	10	Automatic Calibration
	1	Sample Interface Malfunction
	8	Secondary Analyzer Malfunction
	1	Excess Drift Primary Analyzer
	26	Primary Analyzer Malfunction
Line 7	7	Automatic Calibration
	0	Data Handling System Malfunction
	8	Secondary Analyzer Malfunction
	0	Excess Drift Primary Analyzer
	1	Primary Analyzer Malfunction